

## **REMARKS**

In the office action, the examiner makes final his previous restriction requirement, and rejects all elected claims as being obvious under 35 U.S.C. §103(a). Applicants respectfully traverse the obviousness rejections and request that the examiner reconsider the application in the light of the following comments.

### ***Claim Rejections – 35 U.S.C. §103***

Claims 21-22, 24-26, and 28-30 were rejected as obvious over Behrens in view of Zahradnik. The examiner must make a *prima facie* case of obviousness. Three criteria must each be met for *prima facie* obviousness. [MPEP 2143] One of these criteria is that each and every claim limitation must be taught or suggested in one or the other reference (or both) when two references are combined in an obviousness rejection. [MPEP 2143.03] The applicants direct attention to the limitation in claim 21: “introducing into the diffuser a chemical additive having bubble coalescence retardation properties or wetting agent properties or both.” (Emphasis added) The applicants further direct attention to the limitation in claim 22: “wherein the chemical additive is coated on the diffuser before use.” This limitation was an elected “species.” The examiner relies solely upon Zahradnik with respect to the limitation of claim 22. Zahradnik teaches forming solutions of certain alcohols or electrolytes in water solutions of saccharose and xanthan. He blends a homogeneous mixture of a bubble coalescence retardation additive in the water solution, then turns on the bubbles. The examiner suggests that during the perhaps mere momentary period after the solution is in place in the vessel 1 but before the air supply is turned on to make bubbles, that this constitutes coating the diffuser with the additive before use. The applicants submit that this exposure to the additive occurs in the course of using the diffuser, not applying a topcoat [¶ 28] before use. But to eliminate any such strained interpretation, the applicants amend claim 22, citing ¶ 38 among other passages for support (as well as claim 21), to read as follows:

22. The method of claim 21, wherein the chemical additive is coated on to the diffuser and allowed to set before use in water to suppress noise in the marine seismic survey.

Clearly, the limitation of this amended claim is neither taught nor suggested by either Behrens or Zahradnik. Therefore, combining these two references cannot make a *prima facie* case that amended claim 22 is obvious. To further focus on a preferred embodiment as stated in ¶ 38, the applicants amend the claim set to add the new claim:

52. The method of claim 22, wherein the chemical additive is applied to the diffuser's surface with a brush.

The applicants believe that the same argument holds true for claim 21, where the pertinent limitation is “the step of introducing into the diffuser a chemical additive . . .” However, again the applicants will amend the claim to define the invention more precisely: “the step of introducing into the diffuser, before use in water to suppress noise in the marine seismic survey, a chemical additive . . .”

The applicants believe that the quoted feature from amended claim 21 is neither taught nor suggested by either Behrens or Zahradnik. Therefore, combining these two references cannot make a *prima facie* case that amended claim 21 is obvious.

*Prima facie* obviousness also requires motivation to combine Behrens and Zahradnik. [MPEP 2143.01] Since there is no explicit or implicit suggestion to combine within either Behrens or Zahradnik, the examiner asserts that one of ordinary skill would know after reading Zahradnik that Behrens's method could be changed to reduce bubble size by “introducing into the diffuser a chemical additive having bubble coalescence retardation properties or wetting agent properties or both” (quoting the operative language of claim 21, as examined). The examiner further suggests that the ordinary artisan would want to do this “in order to influence the size of bubbles so

that aperture size and orientation [the only techniques taught by Behrens] do not need to be continuously controlled to obtain certain bubble sizes.” The applicants submit that this argument fails because Behrens actually teaches away from it. Behrens teaches a range of bubble sizes, although “relatively large bubbles are preferred.” (Col. 4, lines 59-61) Behrens further discloses that certain nozzle orientations are to be avoided because they “tend to create undesirable small bubbles.” (Col. 5, lines 39-40) Behrens further recognizes that bubbles “may combine with other bubbles.” (Col. 4, line 29) Reading these passages, the ordinary artisan would be motivated in the opposite direction from wanting to retard bubble coalescence, since coalescence produces larger bubbles. Lack of motivation to combine Zahradnik with Behrens is a second, independent reason why the examiner fails to make a *prima facie* case of obviousness. Instead, the applicants believe the examiner’s arguments are hindsight reconstruction. “This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components.” *Princeton Biochemicals vs. Beckman Coulter, Inc.*, 411 F.3d 1332 (Fed. Cir. 2005).

The third required element of *prima facie* obviousness is a reasonable expectation that combining two references will be successful. [MPEP 2143.02] The applicants submit that there is no reasonable expectation, based on reading Behrens and Zahradnik, that an approach such as coating the diffuser before use (or otherwise introducing the chemical additive “into the diffuser”) could be successful in lieu of uniformly mixing the additive into the water, which is all that is taught by the two references regarding use of chemical additives. A person interested in bubble curtains for seismic noise suppression will know this technical problem involves an enormous volume of water (a survey area in the ocean) and a moving diffuser. Such an ordinary artisan is not going to be motivated to seek answers in a publication (Zahradnik) where the technical problem’s setting is a laboratory container of water and a stationary bubble emitter. These arguments are made at ¶ 25 of the present application. Yet, inventive ways to overcome these differences are disclosed in the present application along with test data demonstrating that it works (Figs. 10-12).

This surprising result is a third independent reason why the examiner fails to make a *prima facie* case of obviousness.

Thus, there are at least three independent reasons why the examiner has failed to make a *prima facie* case of obviousness against claims 21 and 22.

Regarding the rejection of claims 28-30, the applicants could find no mention in Behrens of “preconditioning the hose by soaking it in water before coating it.” (As recited in claim 28) Behrens’s hose is intended for use in water, but he says nothing about preconditioning the hose or coating the hose (coating with what?). The examiner omitted the phrase “before coating it” in his reference to claim 28, and then appears to deem that the actual use of the hose as a bubble source, which must necessarily occur in water, amounts to the “preconditioning” called for by the claim. By its meaning, the word “preconditioning” requires that conditioning must occur before something else occurs. Claim 28 supplies what that something else is: coating the hose with the chemical additive, a subject that is entirely absent in Behrens. Thus the words “before coating it” are a valid limitation in claim 28, and cannot be ignored in comparing to the prior art. Applicants believe that the rejection of claims 28-30 is improper for this second reason, the first reason being that the applicants believe that claim 28 depends on non-obvious claims as argued above.

Regarding the rejection of claims 31-33, as a preliminary matter, the applicants admit in the application that block copolymers are known in relation to effect on bubble size, but in unrelated art areas. Indeed, Cosentino’s technical problem concerns the human heart and oxygenation of blood in a human body. There is no suggestion whatever in Cosentino that a block copolymer could be used to make a longer lasting bubble curtain to suppress unwanted seismic waves in a marine geophysical survey. Neither Behrens, Zahradnik nor Cosentino suggests coating or otherwise introducing such an additive to a bubble diffuser.

### CONCLUSION

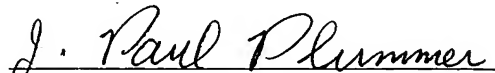
The applicants believe that they have demonstrated that all claim rejections are improper. If the examiner agrees, the applicants understand that the examiner will then examine claim 21 as to embodiments in which the chemical additive has wetting agent properties, and any other non-elected embodiments that the examiner may believe require a separate search (for example, claim 23). If the results of that examination are favorable for the applicants, and therefore claim 21 is allowed, the applicants are entitled to a full range of dependent claims under claim 21. Therefore, the applicants amend the present claim set in anticipation of that result, designating such presently non-elected claims as *withdrawn*.

The applicants respectfully request allowance of all pending claims, including those added by amendment herein.

The Examiner is authorized to charge all required fees to ExxonMobil's Deposit Account No. 05-1328. If Examiner wishes to discuss this application with counsel, please contact the undersigned.

Respectfully submitted,

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